

FACTS ON DRINKING WATER

Arsenic

Arsenic (As) is a natural element found in the Earth's crust.

Some areas of New Brunswick have a greater potential for elevated arsenic levels in drinking water.

Sources

Arsenic is commonly found in well water throughout New Brunswick. The presence of arsenic in well water depends on the rock and soil type in the area. For geographic distribution of arsenic in New Brunswick, visit New Brunswick's Groundwater Chemistry Atlas at <http://www.gnb.ca/0009/0371/0014/index-e.asp>.

The most common source of arsenic in groundwater is through erosion and weathering of soils, minerals, and ores. Industrial effluents and pesticide runoff may also contribute arsenic to water in some areas.

Health Risks

Guidelines for Drinking Water Quality are of two different types:

Maximum Acceptable Concentrations (MAC) are based upon potential adverse health effects (listed in this factsheet if applicable) but water test results that exceed these levels do not necessarily indicate any immediate health problem. This is because whenever possible MACs are developed to be low enough that years of exposure at this level would still only increase the health risk slightly.

However, corrective actions should be taken if water test results exceed the MAC in order to remove any potential for increased health risk.

Aesthetic Objectives (AO) are not based upon health effects, but water test results that exceed these levels may indicate that the water could have objectionable taste, odour, appearance or other factors.

Corrective actions are recommended if water test results exceed the AO but may not be necessary.

Maximum Acceptable Concentration for Drinking Water = 0.01 mg/L

In water, arsenic has no taste, smell, or colour. It can only be detected through a chemical test.

The Canadian Drinking Water Quality Guideline for arsenic is 0.01 milligrams per litre (mg/L).

Short-term exposure (over days or weeks) to high levels of arsenic in drinking water can result in nausea, diarrhea, and muscle pain.

Long-term exposure (over years or decades) to low levels of arsenic in drinking water may cause certain types of cancer.

The risk to human health is through ingestion only – drinking, cooking, teeth brushing. Well water with arsenic levels greater than 0.01 mg/L may safely be used for bathing, handwashing, dishwashing, and watering a garden.

The guideline limit for arsenic is based on the level that can be achieved by certified treatment units. Make every effort to keep arsenic levels as low as possible in drinking water.

Testing

Regularly test your well water for a standard suite of chemical parameters, including arsenic. Use an SCC or CALA accredited water testing laboratory. Find a list of accredited laboratories at <http://www.scc.ca> or www.cala.ca.

Get the special sampling bottles and instructions on proper sampling from the laboratory.

For more information on water testing services, please see Department of Environment's water testing services at <http://www.gnb.ca/environment>. Cost of analysis will vary depending on the accredited laboratory and the number of parameters being tested.

Solutions

If arsenic is present in the first test, get a second test to confirm the original results.

If arsenic is confirmed to be present in the well water,

- Find an alternate source of water for drinking, cooking, and teeth brushing, such as bottled water or a dug well that has been tested and found to be safe, or
- Treat your current source of water to reduce arsenic levels.

Treatment

Arsenic cannot be removed from water through boiling, chlorination, or pitcher-style filtration units. Boiling water may increase the concentration of arsenic.

Effective treatment methods include

- adsorption
- anion exchange
- distillation
- reverse osmosis

Buy a treatment system that has been certified to meet the current NSF standards for arsenic reduction. NSF International is a not-for-profit, non-governmental organization that sets health and safety standards for manufacturers in 80 countries. See its website at www.nsf.org.

Once installed, re-test your water to ensure the treatment system is working properly. Maintain the system according to the manufacturer's instructions to ensure a continued supply of safe drinking water.

For more information on water treatment, please contact a private water treatment company.

Considerations

Drilled wells are more vulnerable to arsenic contamination than dug wells.

Considerations for anion exchange method

Arsenic is a negative ion (anion) in solution. When you use anion exchange treatment, the resin in the unit will remove certain anions more readily than others. If other more preferred anions are present such as uranium or sulphate, the effectiveness of the unit may be reduced. The resin in the anion exchange unit may need to be regenerated more frequently to reduce the concentration of arsenic to a satisfactory level. It is important that a detailed chemical analysis of your water be completed to determine if other substances are present that will affect arsenic treatment.

If the anion exchange unit is not properly maintained, the arsenic contained on the resin bed may rapidly detach, leading to higher levels of arsenic in the treated water than the untreated water. It is important to follow instructions for resin regeneration and replacement.

Arsenic may be in a form that is not readily removed by anion exchange. When this is the case, pre-treatment by oxidation may be required.

For more information, please contact the nearest regional Health Protection Branch office:

Bathurst

165 St- Andrew Street
(506) 549-5550

Grand Falls

131 Pleasant Street
(506) 737-4400

Shippagan

239B, boulevard J.D. Gauthier
(506) 336-3061

Campbellton

10 Village Avenue, Unit 15
(506) 789-2549

Miramichi

1780 Water Street
(506) 778-6765

St. Stephen

41 King Street
(506) 466-7615

Caraquet

295, boulevard St-Pierre Ouest
(506) 726-2025

Moncton

81 Albert Street
(506) 856-2814

Sussex

30 Moffett Avenue
(506) 432-2104

Edmundston

121 Church Street
(506) 737-4400

Perth-Andover

35 F Tribe Rd.
(506) 273-4715

Tracadie

3520, rue Principale
(506) 394-3888

Fredericton

300 St Mary's Street
(506) 453-2830

Saint John

55 Union Street
(506) 658-3022

Woodstock

200 King Street
(506) 325-4408